

WHAT IS CLAIMED IS:

1           1.     A method that restores communication in a mesh network between a first  
2     end node and a second end node, comprising:

3                 transmitting a communication signal over a first communication path  
4     comprising the first end node, the second end node and one or more first intermediate  
5     nodes;

6                 detecting an error condition in at least one of the first end node and the  
7     second end node; and

8                 rerouting the communication signal over a second path based on the  
9     detected error condition, the second path including the first end node, the second end  
10    node, and one or more second intermediate nodes, wherein the second intermediate nodes  
11    are disjoint from the one or more first intermediate nodes to restore communication.

1           2.     The method of claim 1, wherein the second path further includes one or  
2     more second transmission lines each having a plurality of channels, and at least one  
3     channel used to reroute the communication signal is determined after the error condition  
4     is detected.

1           3.     The method of claim 2, further comprising sending one or more back-off  
2     commands to release at least one channel used to reroute the communication signal.

1           4.     The method of claim 1, wherein the first and second end node coordinate  
2     rerouting the communication signal over the second path.

1           5.     The method of claim 1, wherein the mesh network is an optical mesh  
2     network.

1           6.     The method of claim 1, wherein the second path is determined before the  
2     error condition is determined.

1           7.     The method of claim 1, wherein the step of rerouting the communication  
2     signal includes issuing commands from the first end node to the one or more second  
3     intermediate nodes to bidirectionally reroute the communication signal along the second  
4     path.

1           8.     The method of claim 1, wherein the step of routing the communication  
2     signal includes:

3 sending a failure indication from the first end node to the second end node;  
4 and  
5 issuing commands from the second end node to the one or more second  
6 intermediate nodes to bidirectionally reroute the communication signal along the second  
7 path.

8 9. The method of claim 1, wherein the step of rerouting the communication  
9 signal includes issuing commands from the first end node to the one or more second  
10 intermediate nodes to unidirectionally reroute the communication signal along the second  
11 path in a first direction.

12 10. The method of claim 9, wherein the step of rerouting the communication  
1 signal further includes issuing commands from the second end node to the one or more  
2 second intermediate nodes to unidirectionally reroute the communication/signal along the  
3 second path in a second direction.

4 11. The method of claim 1, wherein the mesh network is a synchronous optical  
5 network (SONET) defined by the ANSI T1.105.

6 12. The method of claim 1, wherein rerouting the communication signal over  
7 the second path uses a contention technique.

8 13. A self-healing mesh network having a first end node and a second end  
9 node, comprising:

10 a first communication path that transmits a communication signal, the first  
11 communication path including the first end node, the second end node and one or more  
12 first intermediate nodes;

an error detecting device in at least one of the first end node and the  
second end node; and

a predetermined second path that transmits the communication signal after  
the error detecting device detects an error condition, the predetermined second path  
consisting of the first end node, the second end node, one or more second intermediate  
nodes, wherein the second intermediate nodes are disjoint from the one or more first  
intermediate nodes.

14. The self-healing mesh network of claim 13, wherein the second path  
further includes one or more second transmission lines each having a plurality of

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3 channels, and at least one channel used to transmit the communication signal is  
4 determined after the error condition is detected.

1 15. The self-healing mesh network of claim 13, wherein the communication  
2 signal is rerouted from the first communication path to the second path based on an error  
3 condition from the error detecting device.

1 16. The self-healing mesh network of claim 13, wherein the communication  
2 signal is rerouted from the first communication path to the second path based on a  
3 communication of the second end node.

1 17. The self-healing mesh network of claim 13, wherein the first end node  
2 issues commands to the one or more second intermediate nodes to unidirectionally  
3 reroute the communication signal along the second path in a first direction,

1 18. The self-healing mesh network of claim 17, wherein the second end node  
2 issues commands to the one or more second intermediate nodes to unidirectionally  
3 reroute the communication signal along the second path in a second direction.

1 19. The self-healing mesh network of claim 13, wherein the mesh network  
2 uses a synchronous optical network (SONET) defined by the ANSI T1.105.

20. The self-healing mesh network of claim 14, wherein one or more channels  
of at least one second transmission line is determined using a contention technique.

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